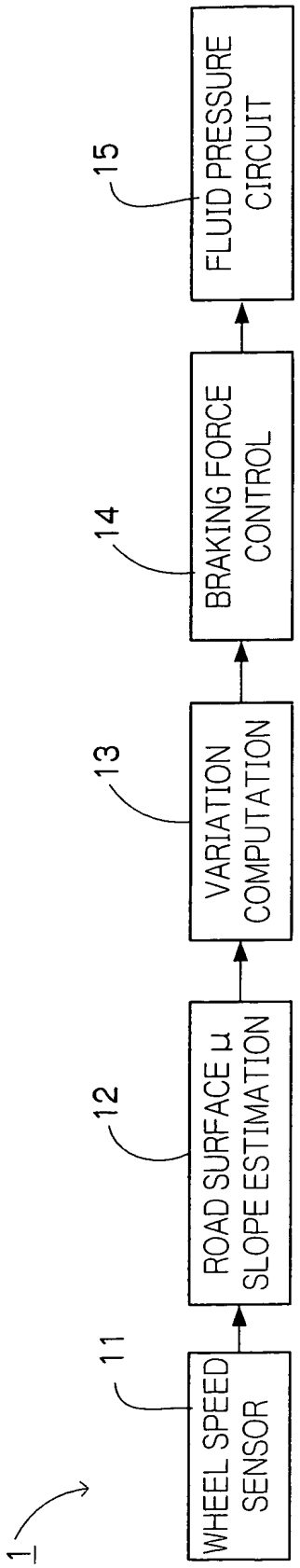
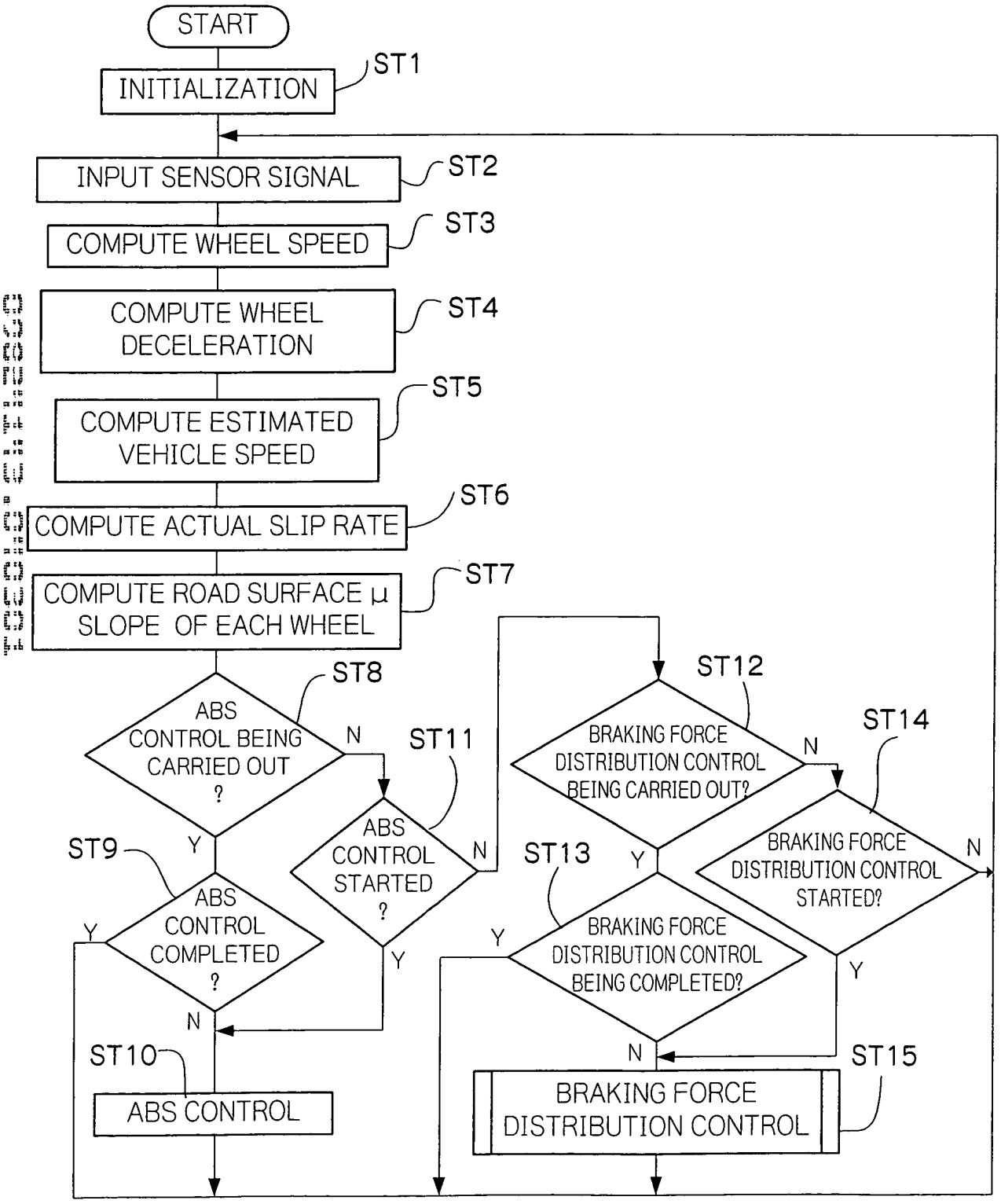
BURNS, DOANE, SWECKER AND MATHIS LLP
APPLN. FILING DATE: APRIL 3, 2001
TITLE: [redacted]KING FORCE DISTRIBUTION CONTROL D[redacted]E
ATTOR[redacted]OCKET NO: 003510-089 2[redacted]ETS

FIG. 1



F I G. 2


START
INITIALIZATION
ST1
INPUT SENSOR SIGNAL
ST2
COMPUTE WHEEL SPEED
ST3
COMPUTE WHEEL DECELERATION
ST4
COMPUTE ESTIMATED VEHICLE SPEED
ST5
COMPUTE ACTUAL SLIP RATE
ST6
COMPUTE ROAD SURFACE μ SLOPE OF EACH WHEEL
ST7
ABS CONTROL BEING CARRIED OUT ?
ST8
N
Y
ST9
ABS CONTROL COMPLETED ?
Y
N
ST10
ABS CONTROL
ST11
ABS CONTROL STARTED ?
N
Y
ST12
BRAKING FORCE DISTRIBUTION CONTROL BEING CARRIED OUT?
N
Y
ST13
BRAKING FORCE DISTRIBUTION CONTROL BEING COMPLETED?
Y
N
ST14
BRAKING FORCE DISTRIBUTION CONTROL STARTED?
N
Y
ST15
BRAKING FORCE DISTRIBUTION CONTROL

F I G. 3

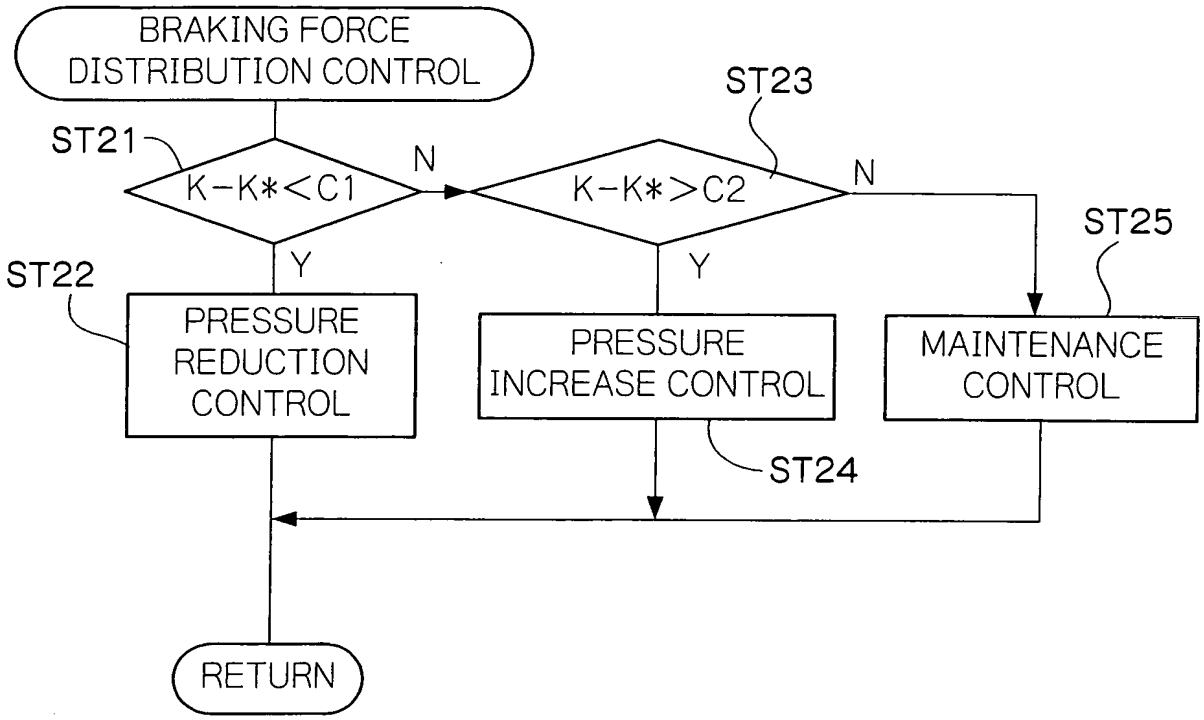

BRAKING FORCE DISTRIBUTION CONTROL
ST21
K−K*<C1
N
ST23
K−K*>C2
N
ST25
Y
Y
ST22
PRESSURE REDUCTION CONTROL
PRESSURE INCREASE CONTROL
MAINTENANCE CONTROL
ST24
RETURN

FIG. 4

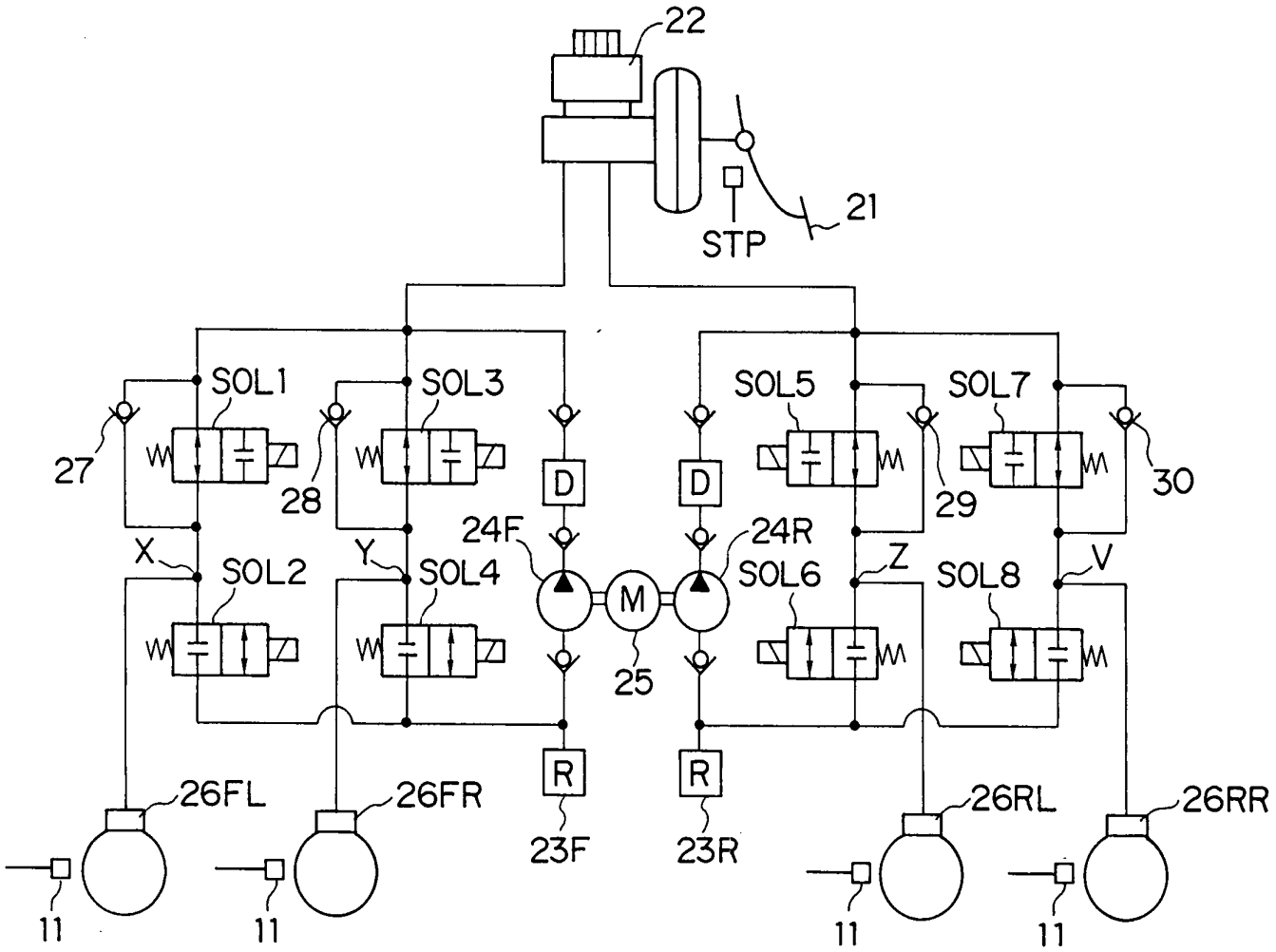

22
21
STP
SOL1
SOL3
SOL5
SOL7
27
28
29
30
D
D
24F
24R
X
Y
Z
V
SOL2
SOL4
SOL6
SOL8
M
25
R
R
26FL
26FR
26RL
26RR
23F
23R
11
11
11
11

FIG. 5

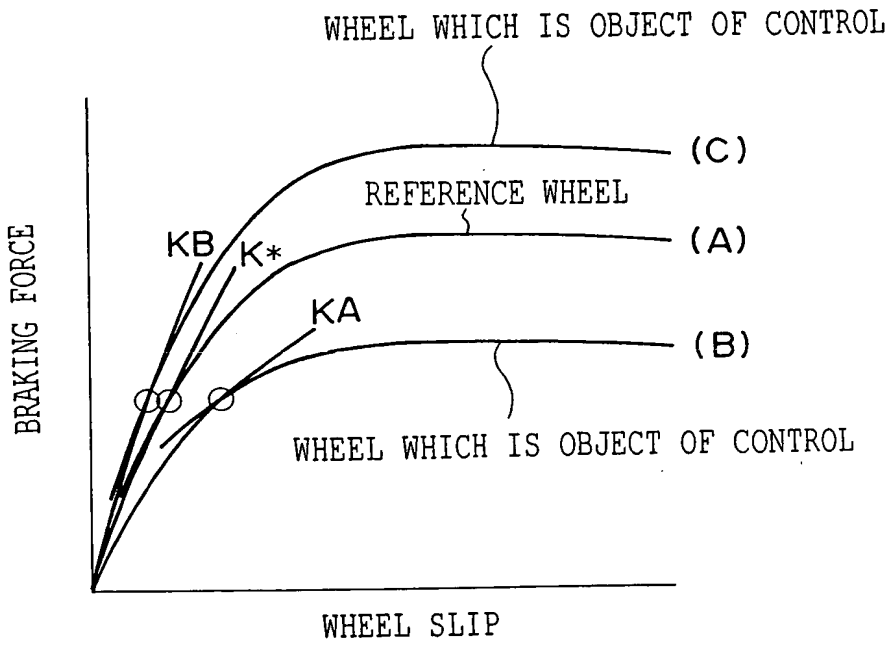

WHEEL WHICH IS OBJECT OF CONTROL
(C)
REFERENCE WHEEL
(A)
KB
K*
KA
(B)
WHEEL WHICH IS OBJECT OF CONTROL
BRAKING FORCE
WHEEL SLIP

FIG. 6

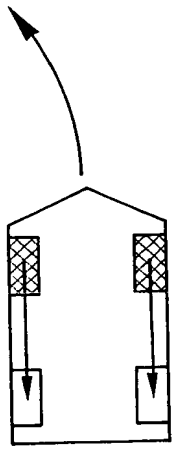


FIG. 7

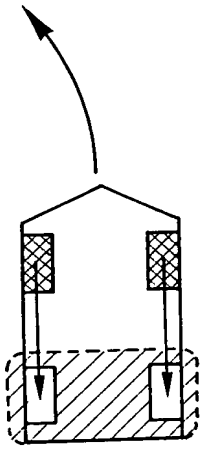


FIG. 8

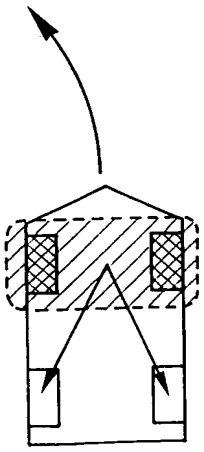


FIG. 9

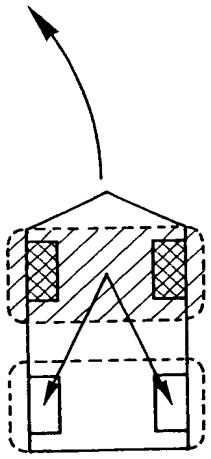


FIG. 10

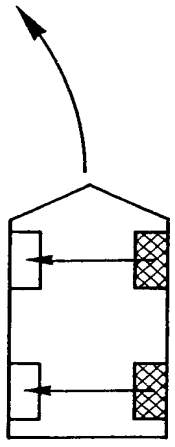


FIG. 11

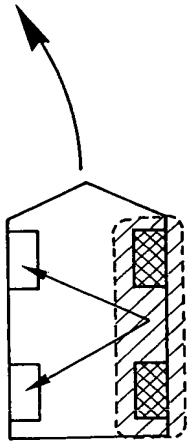


FIG. 12

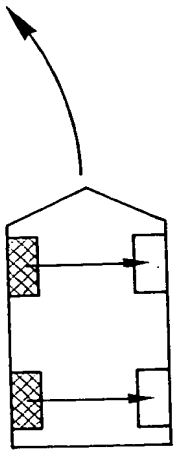


FIG. 13

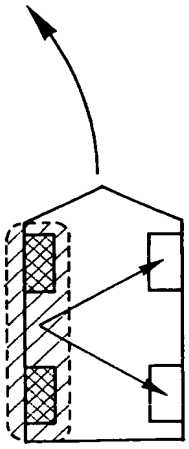


FIG. 14

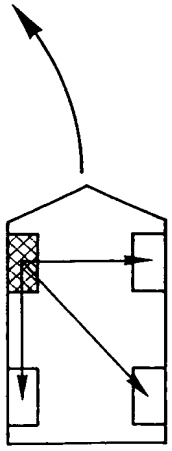


FIG. 15

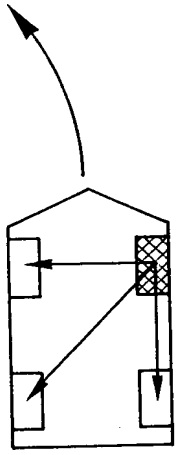


FIG. 16

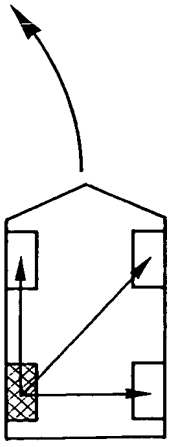


FIG. 17

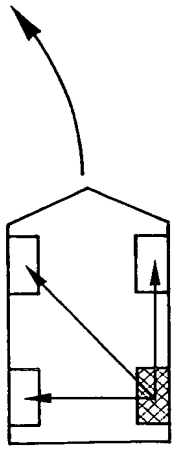
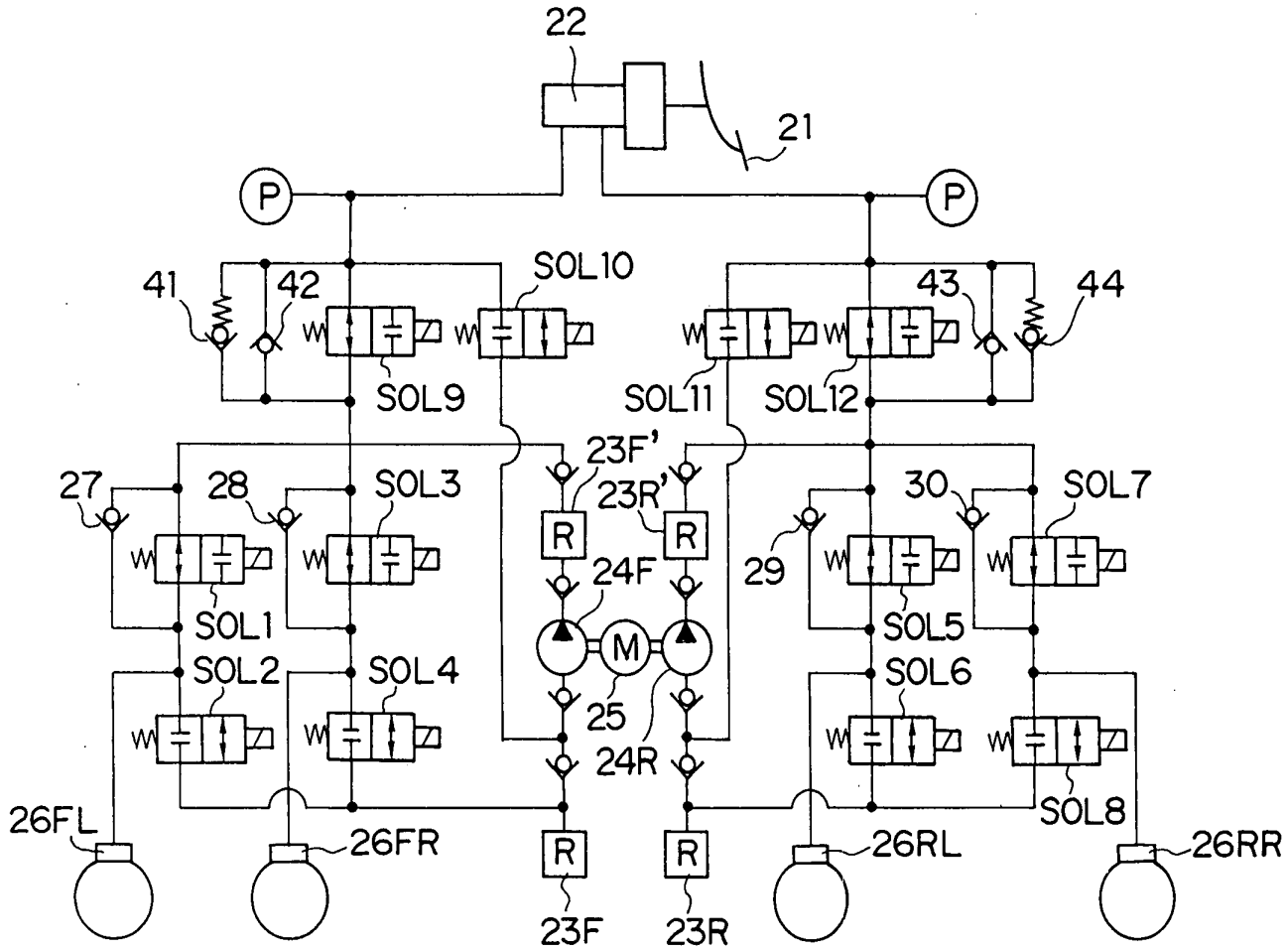
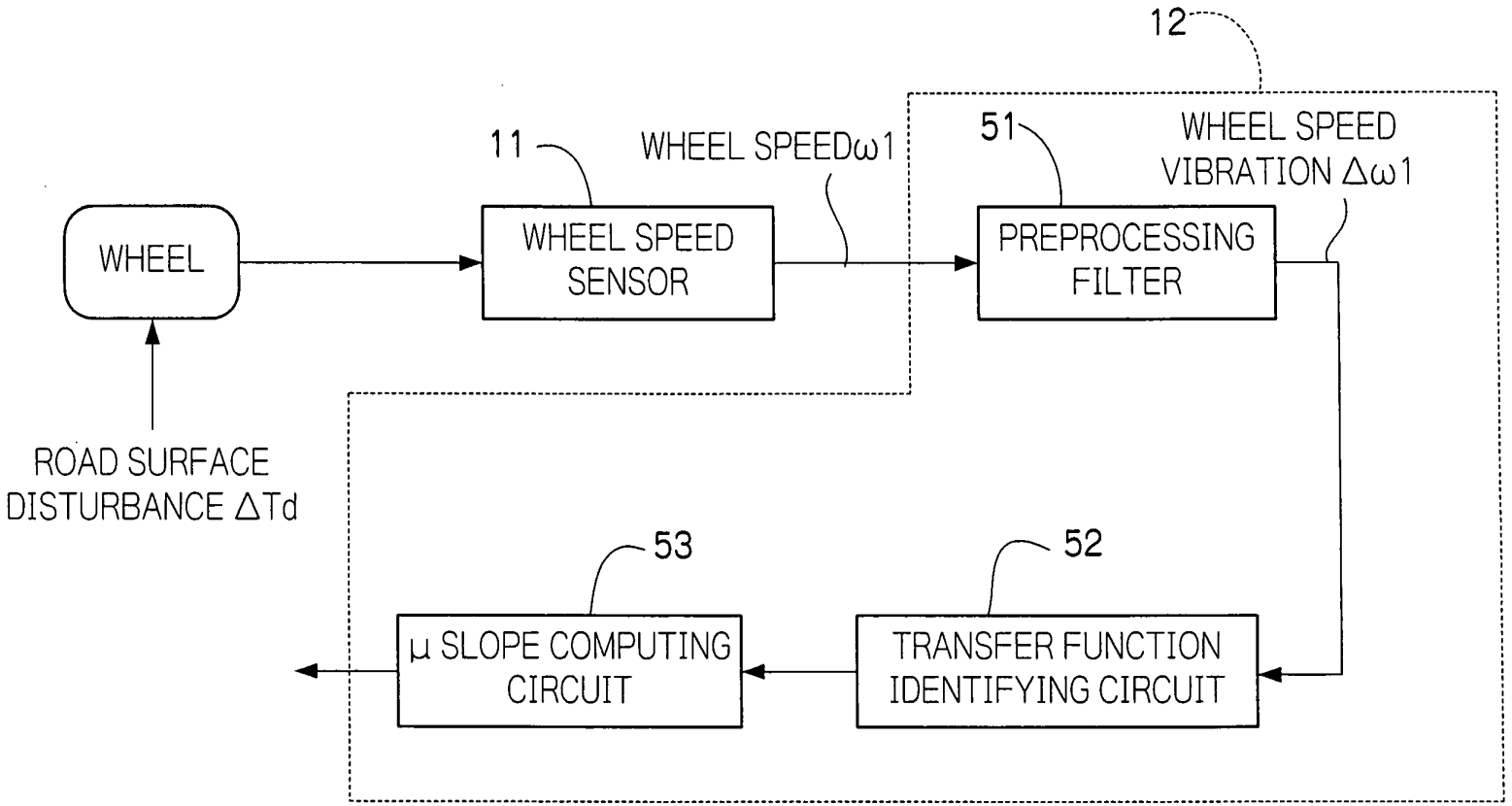


FIG. 18


22
21
P
P
41
42
SOL10
43
44
SOL9
SOL11
SOL12
23F'
23R'
27
28
SOL3
30
SOL7
R
R
29
24F
SOL1
M
SOL5
SOL2
SOL4
SOL6
25
24R
SOL8
26FL
26FR
R
R
26RL
26RR
23F
23R

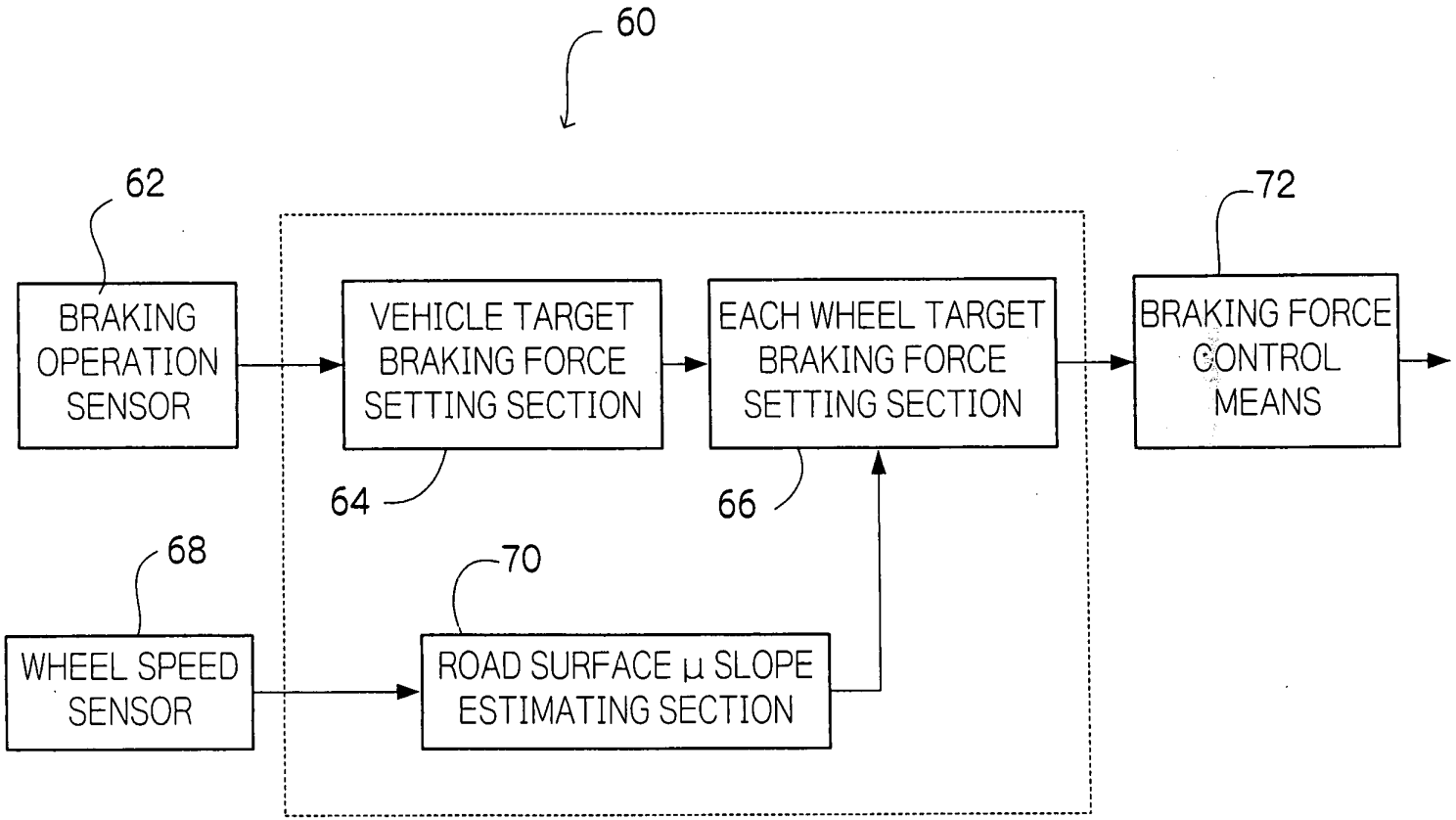
Translation Enclosed

FIG. 19



Translation Enhanced

FIG. 20



F I G. 2 1

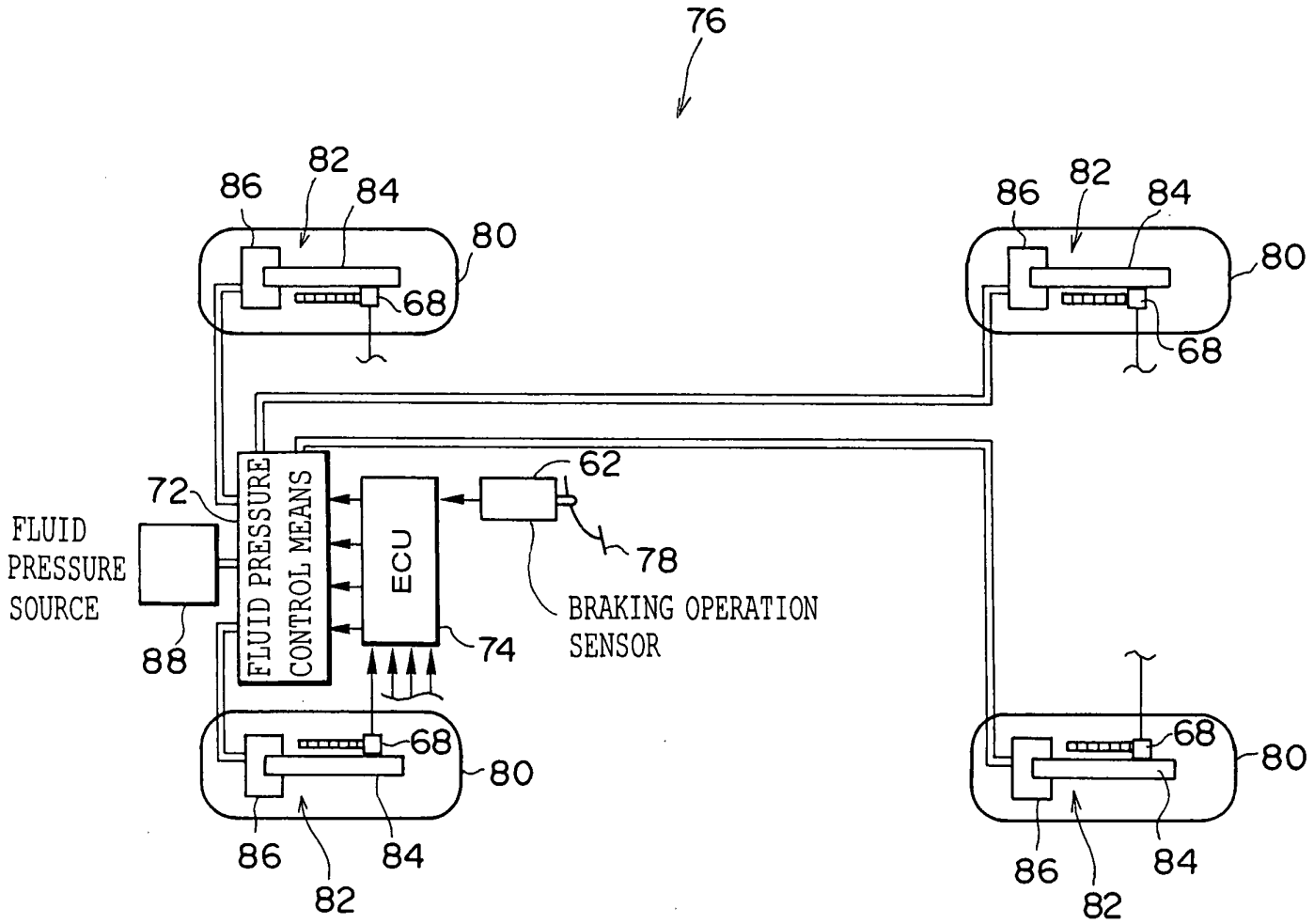

76
82
86
84
80
68
72
FLUID PRESSURE SOURCE
88
FLUID PRESSURE CONTROL MEANS
ECU
74
62
78
BRAKING OPERATION SENSOR

FIG. 22

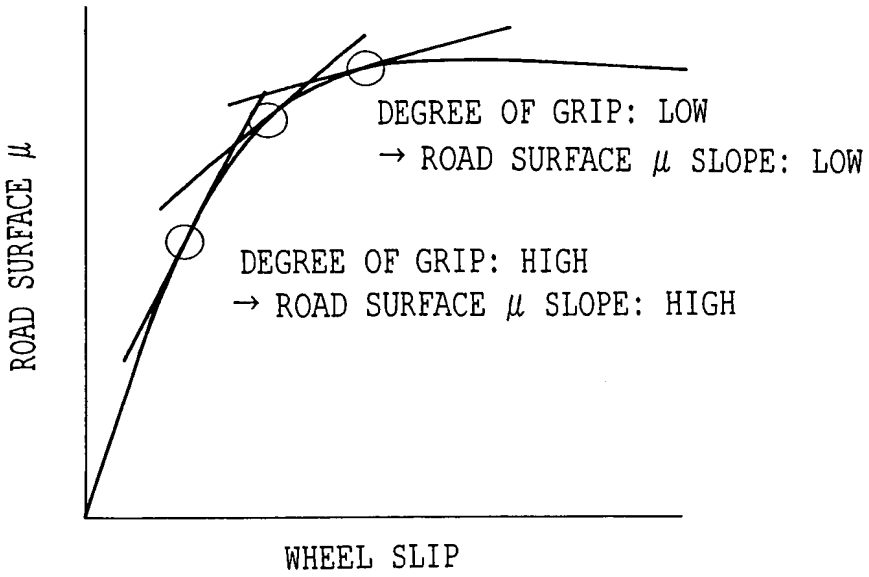

ROAD SURFACE μ
WHEEL SLIP
DEGREE OF GRIP: LOW
→ ROAD SURFACE μ SLOPE: LOW
DEGREE OF GRIP: HIGH
→ ROAD SURFACE μ SLOPE: HIGH

FIG. 23

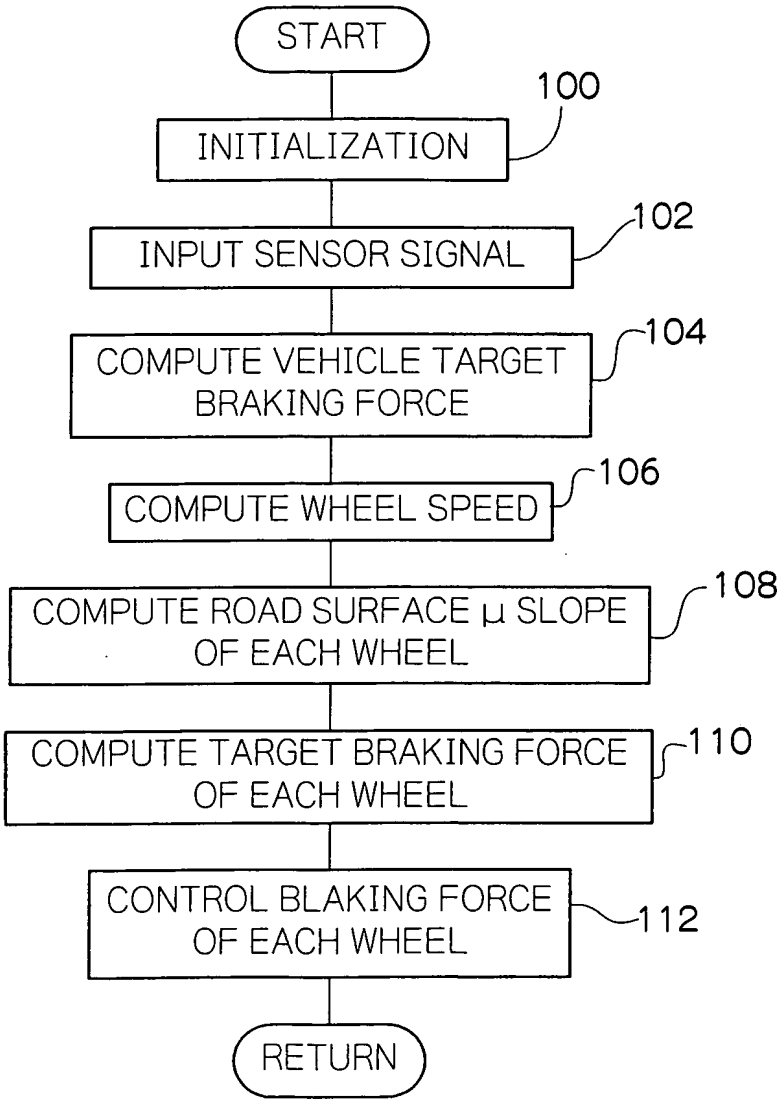

START
100
INITIALIZATION
102
INPUT SENSOR SIGNAL
104
COMPUTE VEHICLE TARGET BRAKING FORCE
106
COMPUTE WHEEL SPEED
108
COMPUTE ROAD SURFACE μ SLOPE OF EACH WHEEL
110
COMPUTE TARGET BRAKING FORCE OF EACH WHEEL
112
CONTROL BLAKING FORCE OF EACH WHEEL
RETURN

FIG. 24

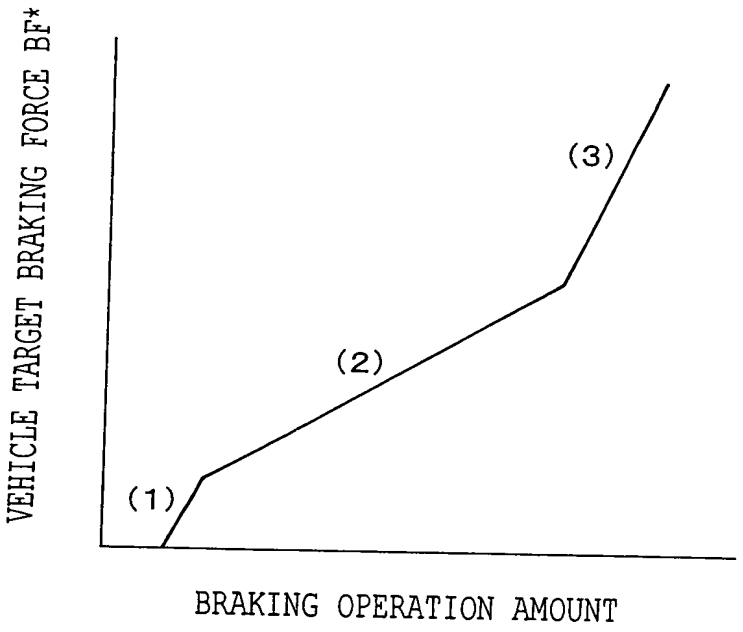

VEHICLE TARGET BRAKING FORCE BF*
(1)
(2)
(3)
BRAKING OPERATION AMOUNT

FIG. 25

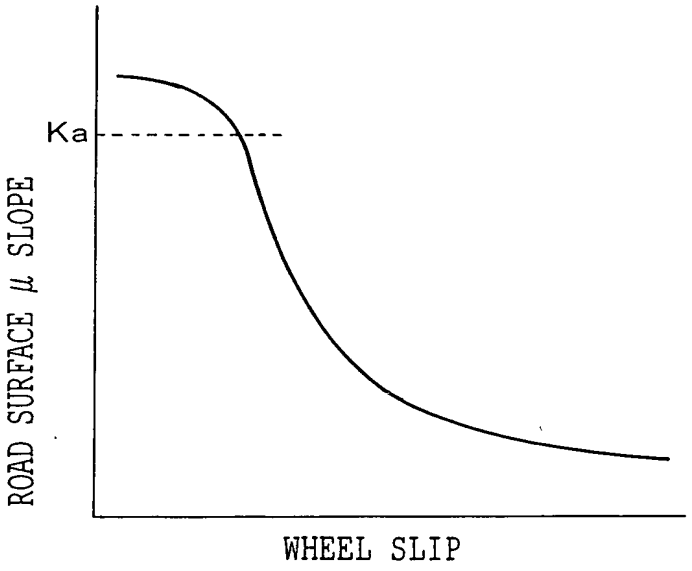
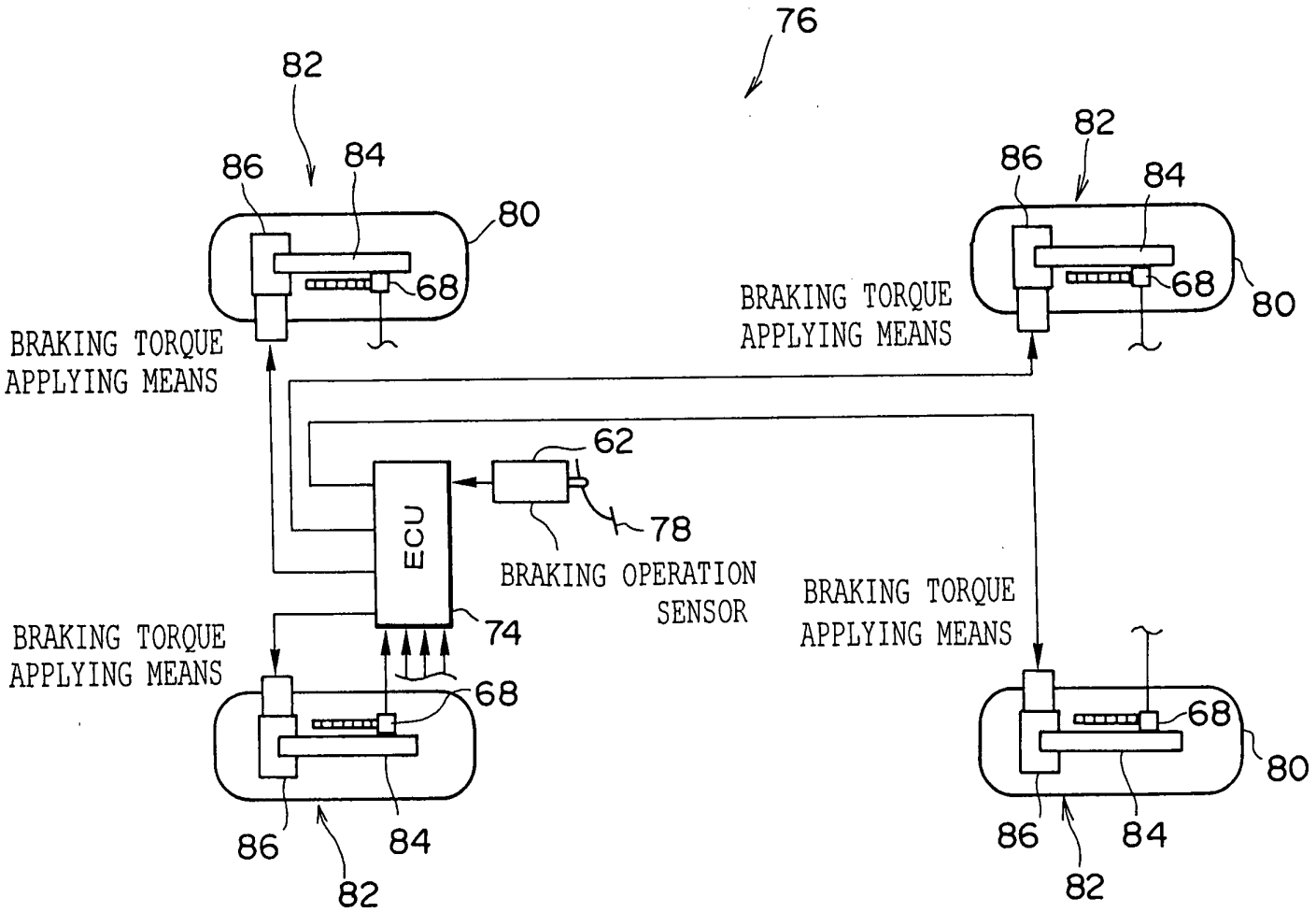


FIG. 26


76
82
86
84
80
68
BRAKING TORQUE APPLYING MEANS
62
78
ECU
BRAKING OPERATION SENSOR
74